

P A COMMUNICATIONS ANNOUNCER SYSTEM

Model; VT21

USER MANUAL

This document comprises “reprints of the original” produced by paste and copy from exhumed files, the first of which is a file named VT21MAN.DOC
it was originally prepared for Works Order WO1292 for CCE Calflex

VT21MAN.DOC Manual dated MARCH 1992, Issue two
pages 1 through 18 are numbered as the original

Appendix B1 Requirement for Addition of Quick Mode page 19
note: the outcome of the requirement differed slightly from this description

The third portion starts at page 20
Installation and commissioning instructions for the upgrade software EPROM supplied
under P A Communications Works Order 1556 for AGIP UK Ltd.
pages 20 through 29 are equivalent to 1 through 9 of the original document

The final portion relates to the additional Status Board as per works order WO2017
14th March 2013

APPENDIX D1 Testing using the Status board. Page 30

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The first portion of this document is a “reprint of the original” produced by paste and copy from a text file called VT21MAN.DOC Manual dated MARCH 1992, Issue two

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1.1 EQUIPMENT OVERVIEW

The VT-21 is a Recorded Voice Announcer (RVA) with two voice stores, a VOICE MESSAGE STORE and DELAY MODULE, it is constructed modular fashion in a 3U high 19 inch rack.

The VT-21 has the following facilities :-

- * Single audio output channel for feeding into a public address system.
- * Message selection is remote controlled.
- * Commands can be accepted from two sources, a tone dialling telephone via a dedicated extension or via a serial port from an external controller.
- * There are 21 different messages of up to 30 seconds duration that may be replayed to the P.A.
- * Messages 1-20 are recorded by the operator using a microphone, connected to the "central" recording module, the controls for message preparation are on the front panel of the rack.
The audio signal (message text) is then retained in the main VOICE STORE.
- * The entire process of storage and replay of the text involves NO MOVING PARTS.
- * Message 21 is the "DELAY MODULE", up to 32 seconds of message can be recorded over the telephone. The caller is welcomed and guided by an internal voice, which invites the user to select zone and then to record their message after the tone. The message text (as picked up via the telephone handset), which is subsequently replayed, under external control.
- * The serial port is bidirectional RS232 using a DB25 connector.
- * Messages may be selected by sending serial ascii
(e.g. to play message 02 send P02).
- * Zone data for messages selected by telephone is returned to the serial port as Z1 Z2 or Z3 for interpretation by the P.A. Controller.
- * An upper case H will interrupt any message currently running, a "G" can be sent within 20 seconds to restart the original message.
- * The equipment is powered from 250V A.C. with an internal "carry over" battery and charger.

1.2 SYSTEM OVERVIEW

The VT-21 is housed in a 19 inch subrack, constructed using modular Eurocard 3U height plug in units. From left to right they are :-

- LA Power lock switch and carry over battery.
- LB Power supply which supplies plus five, plus twelve and negative five volts.
- LC The delay voice store, for message 21.
- LD Control unit and Display.
- LE Telephone line interface (E & M type).
- LF Audio and control module.
- LG The main voice store, for messages 1 - 20.

Assembly Identification.

LA	S33201	Carry over battery unit	(12hp)
LB	S33005	PSU	(12hp)
LC	P11001	3U Voice store.	(4hp)
LD	P11415	Controller + Display	(12hp)
LE	P11309	Telephone Line Interface	(6hp)
LF	P11151	3U Recording module	(14hp)
LG	P12001	3U Voice store.	(8hp)
LH		blanking panel	(6hp)
LJ		blanking panel	(10hp)

1.3

Features of the Modular Announcer Type: VT-21.

Equipment practice	Standard Eurocards. Mounted in 3U 19" cardframe.
Equipment operation	By means of front panel controls, serial command channel and voice response telephone access.

Length of announcements

Delay channel	maximum text capacity of 32 seconds.
V.M.S.	Twenty messages each of 30 seconds text capacity.

Coding of signals	Standard A-law companding code following CCITT Vol.III-2 Rec. G.711, 712, 733. 64Kbit/s.
Frequency range	300-3400Hz ± 3 db
Signal to noise ratio	-50db
Distortion	less than 4%
Temperature range	Operation:- 0DegC -- +50DegC Storage:- -20DegC -- +80DegC
Outputs	balanced output, isolated by line transformer. Impedance can be set for Low Z or 600 Ohm.
Level	nominal 0db to public address line input.
Inputs	Via front panel DIN socket (7 pin)
Sensitivities	Microphone - 200/600 Ohm 210uv, Line/Tape - 47K Ohm 250mv, Automatic Recording Level.
Power requirements	110 - 250 V A.C. + or - 10%
Mains Frequency	47-63 Hz.
Power Consumption	30 Watts.

BT Approval No. S/2944/23/G/452230

2.1 VOICE STORES

The VT-21 has 2 independent voice stores, the delay voice store has 32 seconds variable text capacity, the main voice store has twenty messages each having 30 seconds capacity.

The voice store cards used in the equipment are 3U plug in units. They each have a control microprocessor which is used to manage the storage and recovery of digital samples.

The samples are stored in text memory at a rate of 8000 per second.

The signal to be recorded is sampled and quantised according to CCITT "A Law" which is specifically designed for processing communication quality speech. The sample so processed becomes an encoded number which is stored into memory.

It can be seen that the memory needs to be of sufficient size to accommodate the length of text that comprises the message. The rate at which memory is used is 64,000 bits per second (64Kbps), hence the delay store will require eight "memory chips" for a message of around 32 seconds.

The microprocessor is used to store away the samples into the memory, it is also used to recover the samples so that the waveform may be reconstructed when the message is to be replayed. Hence a similar process to a tape recorder is taking place but doing so with no moving parts, no tape, nor wear to rotating parts or to any magnetic media.

Each announcer card has it's own operating software in the form of a plug in read only memory, which is non-volatile, i.e. it remains if power is disconnected.

The memory chips that are employed to store the message text are the volatile type known as Dynamic RAM which requires that the VT-21 is kept powered to store the text. When the VT-21 is disconnected from the power source by switching off the lock switch it will erase the messages that has been previously recorded.

3.1 POWER SUPPLY

The PARVA range of modular announcers employ standard Eurocard size plug in units, the power source can be specified at time of ordering and can be one of two basic types, for A.C. or for D.C. operation.

This announcer has been configured to accept an A.C. power source, and has an internal "carry-over battery" to maintain input power during generator change over. The illuminated switch at the rear disconnects the incoming A.C. The lock switch on the front panel interrupts both of the power sources for maintenance purposes.

The VT-21 requires an input power source of nominally 240 volts A.C. which is fed to the power supply unit, transformed down and rectified to provide the "raw D.C." of 40/55 Volts to the "secondary switcher".

The term "secondary switcher" refers to a switch mode power supply which does not operate on the mains input but rather that it uses a lower rectified voltage from the "transformer secondary" which is subsequently chopped by the switching transistor.

The D.C. input is stored by an electrolytic capacitor and is chopped by a VMOS power FET at a frequency of about 26KHz.

The output energy is controlled by varying the "on time" of the VMOS power FET (Pulse Width Modulation) and regulated by comparing it's output with a reference.

The plus five volt rail is the main regulated output, the plus twelve is obtained by taking a step-up tap from the output choke.

The auxiliary supply of negative five volts is generated from a separate winding on the ferrite ring upon which the output choke is wound.

Isolation (from earth) is provided by the mains transformer, allowing the zero volt terminal of the power supply to be internally connected to both mains earth and chassis.

FUSES - locations and values.

On rear of VT-21.

Mains	inside IEC receptacle	20mm type 3.15 A M
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On the plug in unit LA, unscrew front panel screws and withdraw.

F1	Battery	mounted on pcb LA	20mm type 3.15 A F
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On the plug in unit LB, unscrew front panel screws and withdraw.

FS1	Raw D.C	mounted on PSU pcb	20mm type 5 A F
FS2	Neg 5V	mounted on PSU pcb	20mm type 1 A T

4.1 INSTALLATION and COMMISSIONING

The microphone and earpiece for text preparation plug into the front of the recording module, the other connections are made at the rear of the VT-21.

Microphone/Line connection

7 pin DIN socket fitted
to front panel of
Recording module **LF**

1	Mic. "Hot" connection
2	Ground
3	Line/tape connection
4	Record run, connect to ground Record pause - open connection
5	Record enable - connect to ground to make Record button on front panel operational.

Headphone connection

Jack socket on front panel, 1/4" 2 pole mono socket.
Headphones impedance 8 - 600 Ohms

A.C. Mains Power (250 Volts) should be connected via the plug in IEC receptacle on the rear panel, using the plug in lead supplied.

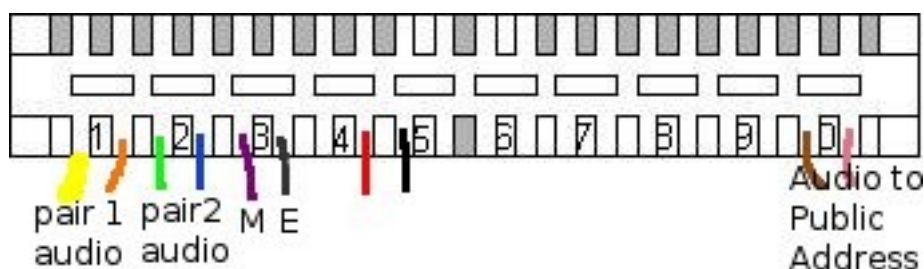
Serial input/output port is via the DB25f 25 way connector on the rear panel. Pin 2 is command input, pin 3 is the response output from the announcer controller and pin 7 is ground.

Krone strip connections :-

Telephone connection.

Pair 1	brown	Audio Pair	10
	yellow	Voice Response	11
Pair 2	green	Audio Pair	27
	blue	Input	28
	purple	M wire	13
	grey	E wire	12
	white	Busy out	29
	red	batt +	14
	black	batt -	15

Audio Output is via the bottom pair of the Krone connector marked pair 0, coloured brown and pink.



4.2 TELEPHONE INTERFACE

A telephone line as terminated at a customer jack socket (NTP) is an example of a PSTN two wire connection. It carries speech in two directions and has a D.C. potential across the two wires which is sometimes used to power modern telephones, a third component is the 75V 25Hz. ringing current which is also sent via the same two wires to alert the customer that a call is waiting.

The two wire connection is compatible with both the "copper wiring" that exists between buildings and the telephone "exchange building" or "switch" and the simple telephone as described in BS6317.

The interface used for a two wire connection to the PSTN (or to a PABX) is called a RING TRIP interface. This interface simulates the simple telephone.

LEVEL ACCESS

The term "LEVEL ACCESS" comes from electromechanical days when each digit dialled involved using equipment on various levels.

When connecting "equipment" rather than "telephones" a different approach is made. The word "Equipment" might mean a portion of the telephone switching system, another rack of switching or a tie line to a more remote location where a smaller "satellite" of the "main exchange" exists.

The "ACCESS" should be fast access, or near immediate access, in contrast with the delay encountered when a ring trip device is accessed and subsequently answers.

E and M

This can be considered to be a version of level access.

Two signalling wires are used, one E the other M, they are connected in addition to the speech circuits. The speech circuits are free of any D.C. and only carry audio.

The two signalling wires are for requesting connection and acknowledging that a connection has been successful.

To connect two pieces of "E & M" equipment together, wire the "E" terminal of one to the "M" of the other (and vice versa).

These signals are true when "grounded" with respect to the exchange "battery".

When an E and M interface is used as a remote control port, pulling the E wire of the interface to exchange ground (or near ground via a resistor) will initiate the voice prompt menu.

The E wire is generally current limited.

5.1 CONTROLS.

The controls are located on the front panel of the "Record Module" (plug in unit LF), which also contains the audio input preamplification stage (VOGAD) and a distribution amplifier to provide a signal to each voice store in order that it may be recorded.

The "DIN" socket on the front of the record module has two audio input pins - pin one is suitable for the microphone and pin three is suitable for tape recorder or "Line level".

There are two press buttons and a rotary switch on the front panel.

The rotary switch is employed to select which audio signal is fed to the monitor jack socket.

- 1 = Delay Voice Store output (message 21)
- 2 = Voice Prompt
- 3 = Main Voice Store output (messages 1 - 20)
(Positions 1 and 2 are for test purposes.)

Both press buttons have more than one function.

The red press button on the record module issues the "request for recording" command.

The red press button will light when interlock is satisfied. (if either microphone or accessory lead is plugged into the DIN socket at the front of plug in unit LF).

The interlock prevents accidental erasure or unauthorised changes to previously stored messages.

Messages 1 - 20 can be prepared by first selecting the message number, using the red button.

The green press button is used to stop recording, or to start replay of a selected message.

INDICATORS.

Record Module has a lamp inside the Red Record button to indicate that recording mode has been selected. (see above)

Voice Stores each voice store has two leds to show it's status.

GREEN	Play led.
RED	Record led.

Power Supply has a red led indicating "POWER ON" and three green leds to show the presence of the three output voltages.

5.2 EQUIPMENT OPERATION

Serial Command Channel.

A DB25 connector is provided on the rear of the equipment sub rack intended for bi-directional communication to the P.A. Controller.

Commands input to VT-21.

P	\$50	Play	Messages may be selected by sending an upper case P (ascii \$50) followed by two digits in ascii format (\$30-\$39) e.g. P17 Will cause message 17 to be played
H	\$48	Halt	Causes the VOICE MESSAGE STORE and DELAY MODULE to halt any current message being played at the time. Causes a "busy" condition to be presented to the ISDX, provided that no caller has already accessed the system using the telephone.
G	\$47	Go	Informs the MESSAGE STORE and DELAY MODULE that the P.A. system is not in use and that any message selected (by telephone) can be replayed. Is also used to restart a message that has been halted.
A	\$41	Abort	Causes the VOICE MESSAGE STORE and DELAY MODULE to halt and abandon any current message being played at the time. E is returned to indicate end of message.
T	\$54	Test	Performs VMS test, character(s) are returned to indicate the status of the VT-21.
Q	\$51	Query	To query if a message has valid text. Upper case Q is sent followed by two digits in ascii format. Y is returned for yes, N for no, B for busy. e.g. Q17 To enquire about message seventeen.

5.3 Command Priorities.

- 1) Message preparation is the highest command priority, this mode can only be entered having first satisfied the interlock by plugging the microphone into the equipment front panel.
Should the VT-21 be placed in this mode and left unattended it will revert to normal standby after a period of 10 - 15 seconds.

In standby the VT-21 is ready to react to either serial commands or to telephone access.

- 2) Serial commands consisting of single ASCII characters from the external public address control system.
- 3) Telephone access, the use of DTMF tones in conjunction with the VT-21's voice prompt.

The VT-21 interprets the serial commands as having higher priority than the commands input via the telephone access (DTMF).

If during the replay of a "telephone selected message" an H is sent to the VMS, it will hold the selected message.

The message may be restarted by sending a G within twenty seconds of the H.

If the P.A. system remains busy for 20 seconds, no G is sent hence the selection is abandoned.

If multiple interruptions occur, the third H will be treated as an Abort - the VMS will then send an E to signify this.

Summary of interrupting command letters.

H	halts the current message being played, which may be subsequently restarted within the next 20 seconds.
Pxx	if issued while a message is already playing will cause the running message to stop and be replaced with the new selection. (will halt the current message and start message number xx instead)
A	Aborts and abandons a selection.

Should the user have selected message 21 and still be connected when a H occurs, they will still be able to store the message.

Once the user has cleared from having recorded no.21 the telephone interface will then signal "busy".

5.4 Status and Data sent from VT-21.

E	\$45	End	end of message is signalled when a message has finished.
Z	\$5A	Zone	Zone data, the Z is followed by one digit. to indicate which zone the user has requested via the telephone. e.g. Z1, Z2 or Z3
Ack	\$06		Acknowledgement of command input.
Nak	\$15		Not Acknowledgement of command input.
	\$D4		"T with high bit set". This is the response to the test command T

In response to a request for validity of message, e.g. Q17

Y	\$59	yes	Indicates that a message exists.
N	\$4E	no	Indicates that no text has been recorded.
B	\$42	busy	Indicates that the voice store is busy, and cannot presently service that enquiry.

5.5 Using DTMF Telephone.

The VT-21 can be instructed to replay a selected message to a desired zone. A telephone capable of tone dialling is employed, sending DTMF (MF4 tones) to the VT-21.

The caller is welcomed by a voice saying :-

THIS IS THE VOICE MESSAGE STORE

followed by a short pause after which the caller will be invited to make a selection :-

PLEASE SELECT MESSAGE NUMBER

the caller should then dial two digits to select the message,

PLEASE SELECT ZONE

the caller should then dial one digit to select the zone,

If message number 21 for the "delay" is selected, a further prompt will say :-

PLEASE RECORD YOUR MESSAGE AFTER THE TONE.

The user can then record their own voice for the message text 21 which is picked up via the telephone handset.

The message text will automatically be shortened by 0.5 second to mute the handset returning onto the telephone cradle.

If a message number is selected that is between 1 - 20, but has nothing recorded the voice will say :-

SORRY, THERE IS NO MESSAGE.

A successful selection will be concluded by the voice saying :-

THANK YOU, GOODBYE.

6.1 OPERATING INSTRUCTIONS

PREPARATION OF MESSAGES 1 – 20

If not already done, turn on the power to the system by means of the rocker switch on the rear panel. The four power leds will illuminate, the remaining front panel leds will all light up briefly then extinguish - this is a test sequence.

Plug the monitor earphone into the jack socket.

Turn the rotary switch to position three.

Plug the microphone into the DIN socket, the red lamp behind the Record button will illuminate indicating that the Record facility is now available if required.

a)	Select Record Mode by pressing the RED BUTTON.
b)	Choose the message number, the display will show the letter "R" followed by two digits corresponding to the choice of message number. If this is the first time that a message is to be recorded the display will be flashing " 00 ?". On pressing the red button again "R01" will appear, replacing the flashing zeros. If recording has already taken place the two digits will correspond to the message that was last recorded. The number may either be advanced by repeatedly pressing the red button or automatic advance will take place when the button is held.
c)	After a short time the desired message number is transferred into memory. The letter S appears in the display to show "selected".
d)	Pressing the "PTT" - (Push To Talk button) on the side of the microphone causes the VT-21 to record.
e)	Pressing the GREEN BUTTON on the front of the recording module ends the recording and starts a replay of what has been recorded.
f)	A message can be checked using the headphone by making a selection as steps a) thru c) and then pressing the GREEN BUTTON.

6.2

The display on the front of the VT-21 is used to provide information to the user.

- * When there is nothing recorded in a message the display will show a "n" after the message number. e.g. S08n
- * When a recording is being made, and the PTT is not pressed the display will show a "p" after the message number to signify "Pause".
- * After a replay message command has been input to the VT-21 the display will show "P" followed by two digits for the message number and a single digit for the zone number, if the request was made via the telephone access.
- * A "w" shows that the VT-21 is "waiting", waiting for a "GO" command.
- * If nothing is stored in messages 1 - 20, the display will show "NO TEXT" and "STBY"
- * When entering recording mode the display will show "Recd".

Appendix A1

COMMAND	SECOND COMMAND	VT-21 ACTION
Messages 1 – 20 selected by serial Pxx	none	play the requested message. send E via serial at end of message.
Messages 1 – 20 selected by DTMF	none	send zone data. wait 20Sec for G. play the requested message. send E via serial at end of message.
Message 21 selected by DTMF	none	record into delay module message. send zone data at end of recording. send E via serial at end of message.
Message 21 selected by serial - P21	none	play delay message send E via serial at end of message.
Messages 1 – 20 selected by serial	A sent via serial	stop message immediately. send E via serial
Messages 1 – 20 selected by DTMF	A sent via serial	stop message immediately. send E via serial
Messages 1 – 20 selected by serial Pxx	Messages 1 – 20 selected by serial Pyy	play message xx interrupt first message play message yy. send E via serial at end of message.

Appendix A2

COMMAND	SECOND COMMAND	VT-21 ACTION
Messages 1 – 20 selected by serial	H sent via serial	stop message immediately. wait for G to start again at beginning
Messages 1 – 20 selected by DTMF	H sent via serial	stop message immediately. wait for G to start again at beginning
M 1 – 20 serially selected, halted by H, waiting for a G.	G sent via serial	play all of the message. send E via serial at end of message.
Messages 1 – 20 selected by DTMF halted by H, waiting for a G.	G sent via serial	play all of the message. send E via serial at end of message.
M 1 - 20 serially selected, halted by H, waiting for a G.	nothing sent via serial within 20 seconds.	timer timeout. send E via serial to signify.
Messages 1 – 20 selected by DTMF halted by H, waiting for a G.	nothing sent via serial within 20 seconds.	timer timeout. send E via serial to signify.

Appendix B1

Requirement for Addition of Quick Mode

Quick Access / Default Zone

User dials Access code to route from PABX to the VMS, the VMS immediately returns a bleep and records the users message, once the user hangs up the message is replayed after a few seconds over the default zone, zone two.

Prompt Access

User dials access code, receives confirmation bleep, but because no action has been taken within the 4 seconds the voice prompts operate as they do at present.

note:

the outcome of the requirement was subsequently changed and differs slightly from the description above.

**P.A.COMMUNICATIONS
ANNOUNCER SYSTEM
Model ; VT21 UPGRADE SOFTWARE
(for the V.M.S.)**

INSTALLATION AND COMMISSIONING INSTRUCTIONS

This document gives the initial installation and commissioning instructions for the upgrade software EPROM supplied under P A Communications Works Order 1556 for AGIP UK Ltd.

These instructions are for technical staff trained in handling electrical and electronic apparatus.

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2 Operational Changes - Background	4
3 Installation	5
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Appendix A	Existing Control Software
Appendix B	Flow Chart for Telephone Access CCNU2 Software
Appendix C	Flow Chart for Telephone Access CCNU3 Software

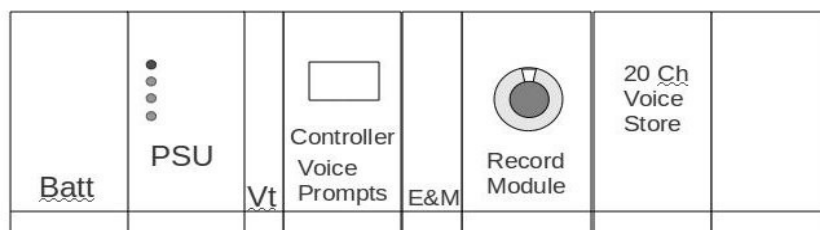
Issue A 3 February 1995

1. INTRODUCTION.

The VT-21, VOICE MESSAGE STORE and DELAY MODULE has one common audio output channel for feeding into the P.A. system.

It has a capacity of 21 messages, each of up to 30 seconds duration.

*Replacement for
missing drawing of
subrack*



The first twenty messages are prepared using a microphone at the equipment subrack, the controller has a display to show which channel number has been chosen.

Selection of the message to be replayed is remote controlled.

from either a DTMF telephone

or from serial (RS232) commands to a db25 connector on the rear of the VT-21.

Message number 21 is the "DELAY MODULE", up to 32 seconds of message can be recorded over the telephone, into a separate VT card.

The caller is guided by voice prompt, recording their own voice for the message text.

The telephone line interface for the ISDX is a four wire "E and M" type, signalling busy to the PABX when required.

Serial Port.

If the telephone is used to select a message, the voice prompt requests that the caller makes a Zone selection.

Zone data for the selected broadcast appears as serial data on the RS232 port.

(Z1 Z2 or Z3 for interpretation by the amplifier control rack).

The RS232 port is bidirectional, messages can be selected by sending "P" (ascii \$50) followed by two numbers in ascii format (\$30-\$39)

The end of a message being played is signalled by "E" (ascii \$45) being transmitted from this port.

An incoming "H" (ASCII \$48) will interrupt any message currently running that had been selected using the DTMF, if a "Go command" is received by the VT-21 within 10 seconds of the "Halt" the original message can be restarted. (the Z data will also be re-sent).

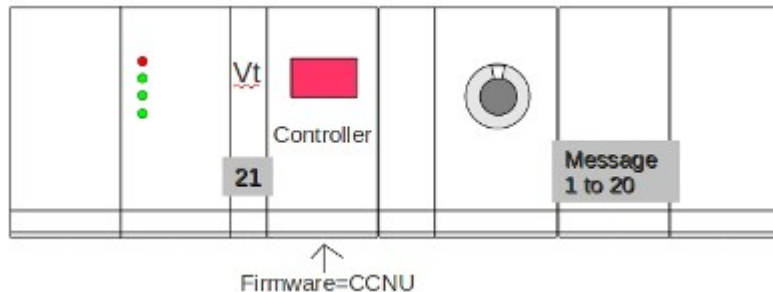
After the 10 seconds is up the VT-21 "times out" and the DTMF selection is abandoned.

A dialog exists between the VT-21 and the external controller, from time to time "T" \$54 is sent the VT21 responds by sending back a different character. (\$D4 is T with high bit set) This is intended to satisfy the system's alarms, by showing that the VMS is "alive and connected".

1. INTRODUCTION (continued).

CONTROL EPROMS.

There are a total of three control software EPROM fitted inside the VT21, this upgrade only affects the Controller.

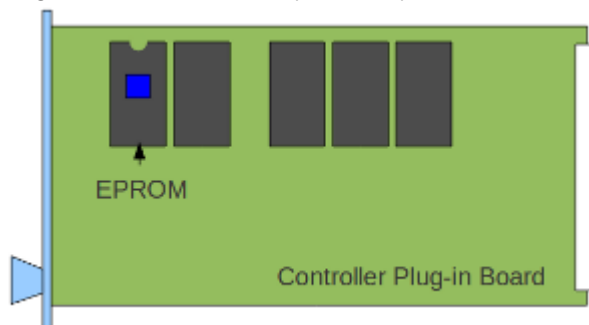


*Replacement drawing
location of controller*

The firmware is contained in a 2764 type EPROM nearest to the front panel of the controller. The revision level of the software can be seen in the led display when the equipment is first powered.

Existing version is level 2 (CCNU2)

*replacement drawing
location of eprom*



Purpose of upgrade

The requirement is as follows :-

Quick Access / Default Zone

User dials Access code to route from PABX to the VMS, the VMS immediately returns a bleep and records the users message, once the user hangs up the message is replayed after a few seconds over the default zone, zone two.

Prompt Access

User dials access code, receives confirmation bleep, but because no action has been taken within the 4 seconds the voice prompts operate as they do at present.

Solution.

- 1) Speed up existing operation by eliminating one scrolling message in the led display, (Phone call), replacing it with an instant message = "Call".
- 2) Provide an additional quick access mode.

2. OPERATIONAL CHANGES - Analysis.

Investigating the "test setup" at Milton Keynes, equipment using the CCNU2 software reacts as follows:-

The VT21 answers a telephone call, display scrolls "Phone Call" in the led display after which the voice prompt says "This is the voice message store"

After a short pause it says "Please enter message number".

There **is a delay** whilst it scrolls the message, during which it isn't possible to interrupt the system.

The four seconds referred to in the requirement may well be the delay in gaining access (while it scrolls Phone Call)

Also see Appendix B.

Requirement

Quick Access / Default Zone

User dials Access code to route from PABX to the VMS, the VMS immediately returns a bleep and records the users message, once the user hangs up the message is replayed after a few seconds over the default zone, zone two

Prompt Access

User dials access code, receives confirmation bleep, but because no action has been taken within the 4 seconds the voice prompts operate as they do at present.

This requirement implies that there are two actions the equipment should take following telephone access. Record spoken message if present or behave as existing.

Problem with Literal Implementation.

Should a caller be using a telephone in a noisy location, the background noise may trigger the Quick Access mode.

Solution

Use dtmf input to select the Quick Access mode.

Any button pressed while the Voice prompt is welcoming the caller will cause the messages to truncate, select message 21 on zone 2.

Benefits of CCNU3.

- All the features of CCNU2.
- Faster initial access.
- Option to select Quick Access mode.
- No perceived operational changes, for existing users.
- Reliable selection, even if caller is using a telephone in a noisy location.

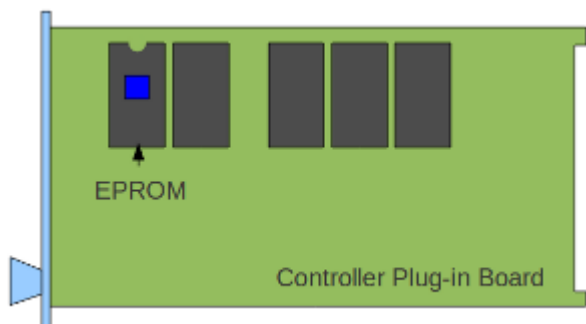
Benefits of CCNU4.

- All the features of CCNU3.
- Shorter delay before telephone message is played over Public Address.

3. INSTALLATION.

Unscrew and remove the controller plug-in board, it is the plug-in unit with the LED display. The control software that is to be changed is contained in a 2764 type EPROM nearest to the front panel of the controller.

*replacement diagram of controller
plug-in board*



Remove the existing CCNU2 chip and replace with CCNU3
This will provide Quick Mode.

If tests show that all is satisfactory, remove the new CCNU3 chip and replace with CCNU4, this should speed up delivery of message 21 following replacement of the telephone handset.

Identification of Software.

The revision level of the software is the numeric portion,
e.g. existing version is CCNU2 = level 2
it can be seen in the led display when the equipment is first powered.

Level	Source code file	EPROM Checksum
2	CCNU2.ASM	168354
3	CCNU3.ASM	166EE3
4	CCNU4.ASM	166D6E

Please contact P.A. Communications technical support for further assistance if required.
Milton Keynes ~~(01908)~~ 567248

note:

PA has moved, the telephone number at Stewkley is 01525 240945

e-mail: support@pacomms.com

Thank you for selecting a P.A. Communications product.

APPENDIX A3

EXISTING CONTROL SOFTWARE. (STRUCTURE of CCNUx.ASM)

\$E000	START
\$E200	Control Section
\$E500	VOICE PROMPT
\$E900	FRONT PANEL CONTROLS
\$F000	SUBROUTINES
\$F400	Play Section
\$F600	TABLES
\$F800	INTERUPT ROUTINE (IRQ)
\$FB00	TEXT POINTERS SETUP (Voice prompt)
\$FB80	VTABLE for voice prompt
\$FFFA	VECTORS

IMPORTANT CCNUx VARIABLES.

RAD \$53 ; Record number

This number determines which message is recorded, valid range 0 - 20.

It is changed by pressing the record button on the front panel of the record module.

The value of RAD is sent to the MAV announcer to select the message for recording. The value of RAD is also used for playback, it is transferred into PLAYNO for review.

TANO \$56 ; Telephone access number

When telephone access occurs, GETNUM invites the caller to "Please select Message number", two tone digits are detected, TANO = 1st digit, DTMF = 2nd digit

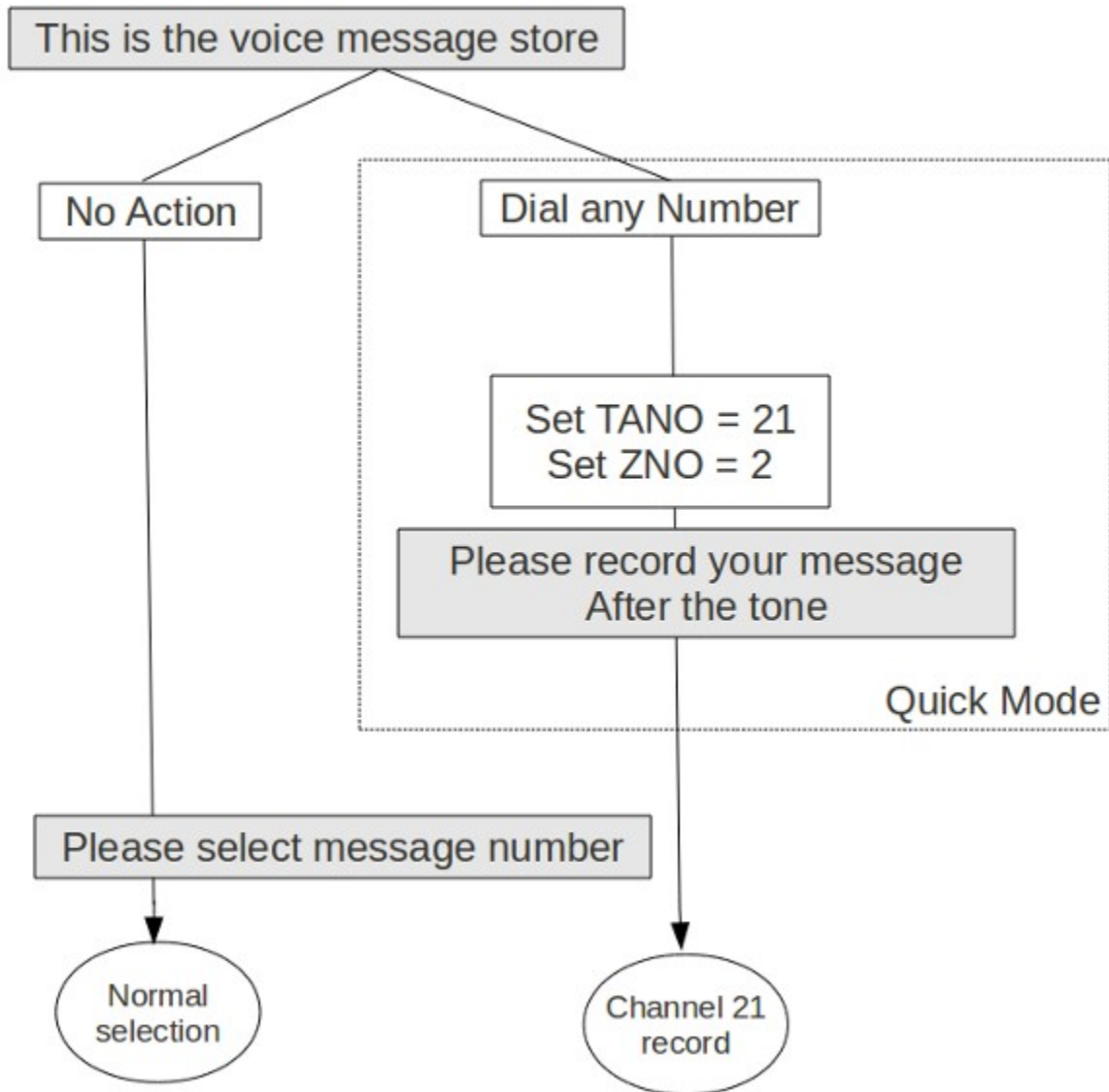
Then the two are evaluated and the result is "re-stored" again into TANO.

ZNO \$57 ; Zone number from phone

GETZONE invites the caller to "Please select zone", a tone is collected and stored into ZNO at CKZIN The zone number is eventually sent by serial using subroutine ZTOGO.

PLAYNO \$58 ; play number

4 Using "Quick Mode"



EXISTING CONTROL SOFTWARE. (CCNUx.ASM continued)

PRIORITY

1st	Text Preparation messages need to be stored for kit to be of use, but Message 21 can be used even if NO TEXT is displayed
2nd	Serial Commands
3rd	Telephone Input

CONTROLLER and CCNUx.ASM

The controller uses two 28 pin text EPROM.

PB4, PB5 and PB6 are used to select voice prompt text.

Ports in use

PA0	DTMF present	PC0	SW A 3 PTT
PA1	announcer engine	PC1	LED A 16 I/F
PA2	U70 bar IRQ	PC2	SW B 7 Play
PA3	ann. engine 8Kz.	PC3	!! input !!
PA4	watchdog	PC4	SW C 30 Record
PA5		PC5	LED C
PA6	8	(PC6 A13)	
PA7	6	(PC7 A14)	

PB0	DTMF i/p b0	PD0	voice prompt
PB1	DTMF i/p b1	PD1	
PB2	DTMF i/p b2	PD2	
PB3	DTMF i/p b3	PD3	text data
PB4	U60 chip enable	PD4	output
PB5	U61 chip enable	PD5	
PB6	text select	PD6	
PB7	ABORT OUTPUT 28	PD7	

U70 UART is mutually exclusive with recording (uses port PA2).

NEW COMMAND "A"

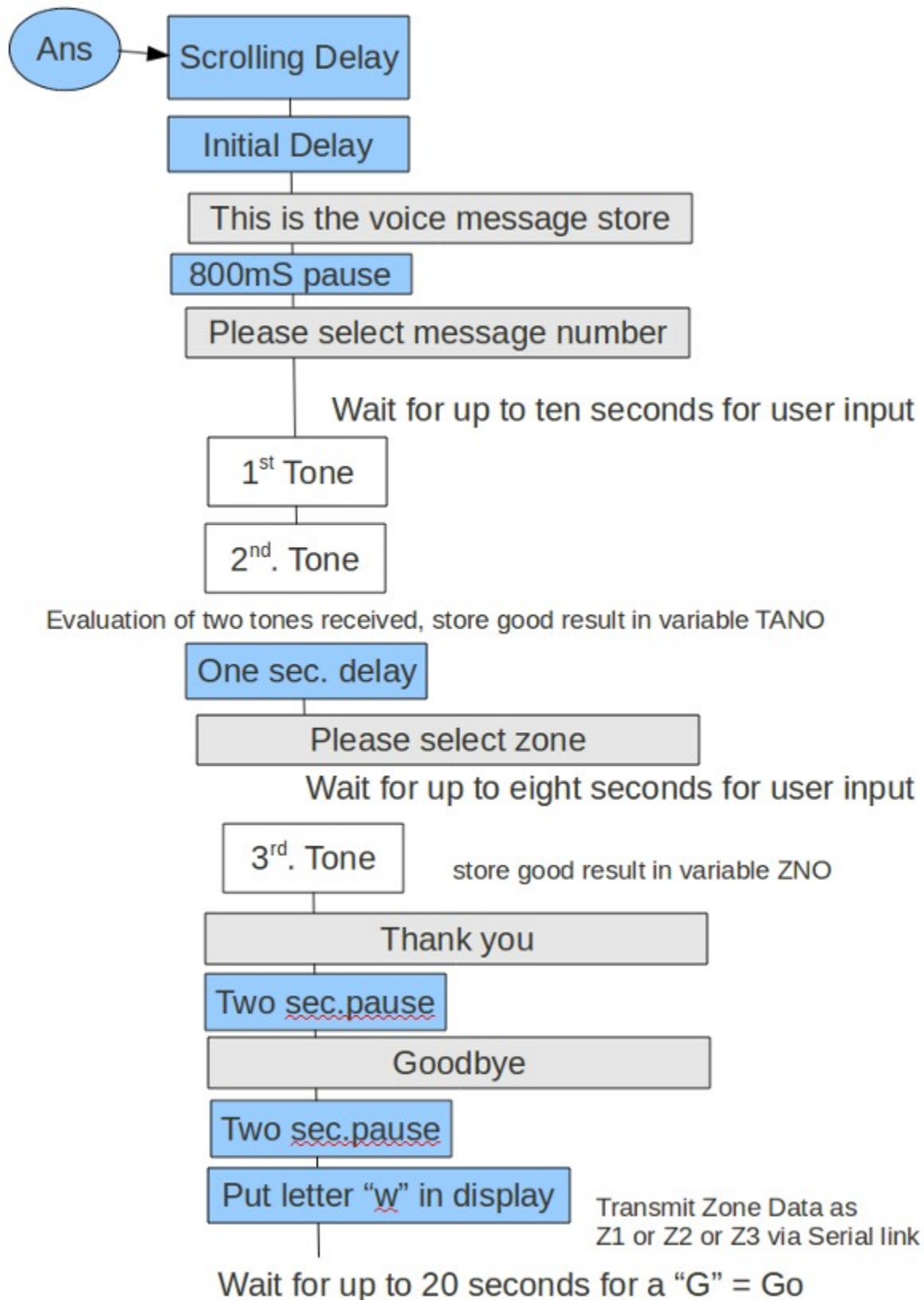
A = Abort, aborts current replay E is sent immediately.

The "new A command" is present in the existing CCNU2.ASM, See SERA in the IRQ.

By 15/5/92 system has gone to Yarmouth, all software works O.K.

APPENDIX B2

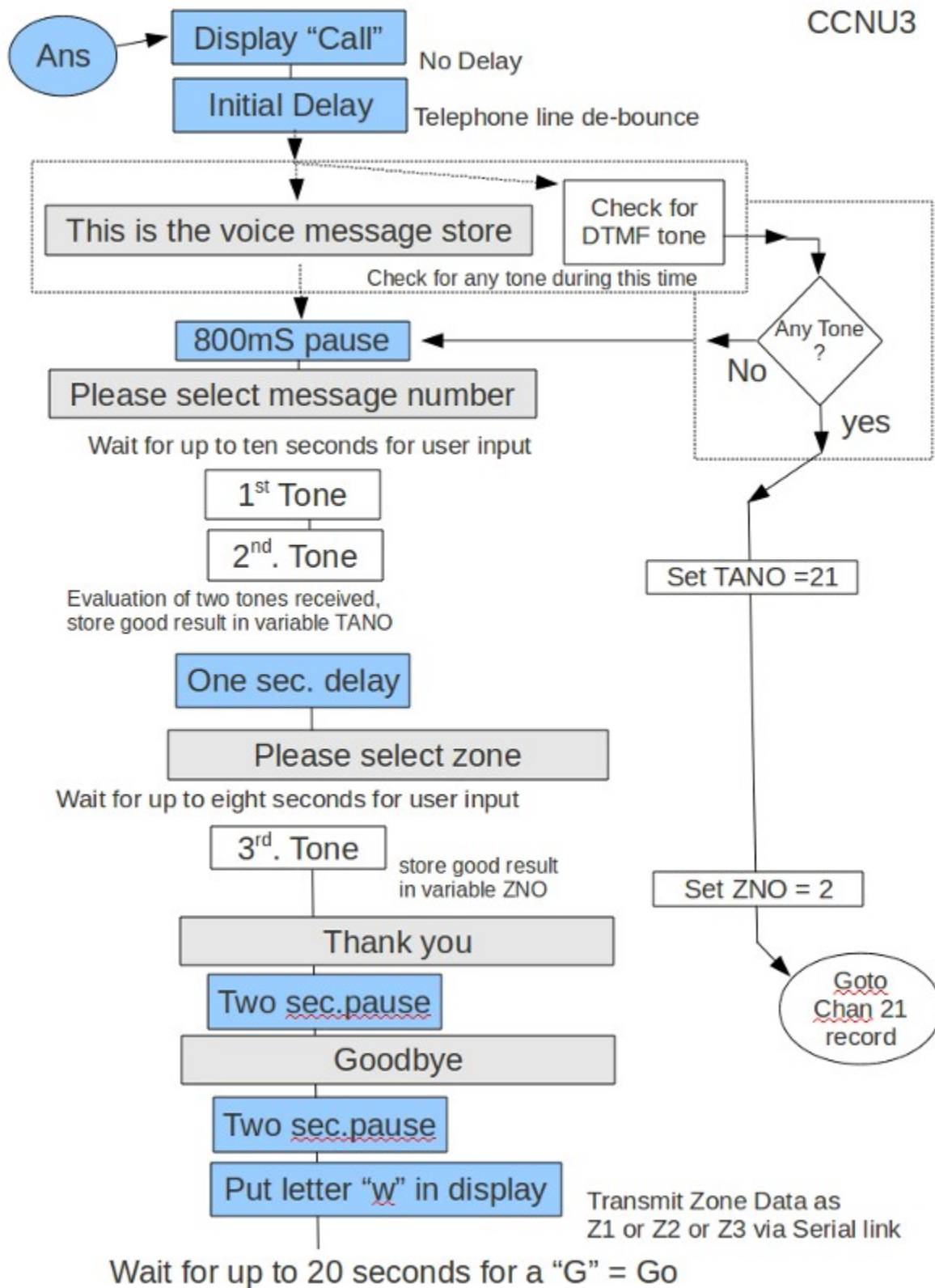
FLOW CHART for Telephone access **CCNU2**



replacement for missing diagram

APPENDIX C2

FLOW CHART for Telephone access **CCNU3**



replacement for missing diagram

----- end of 1556a.doc -----

APPENDIX D1

Works Order 2017

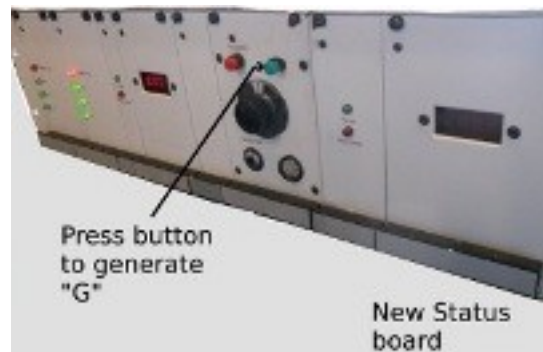
Testing using the Status board.

The new plug in unit to the far right provides an extra four character display, the purpose of which is to offer more information about the VT21's operation.

It "decodes" some of the diagnostic information that appears from time to time as a single character in the controller four character display.

Message preparation is one aspect of the enhancement, the ability to initiate a message without having the serial control input connected is the other aspect.

A message, either a pre-stored message (using local microphone, numbers 1 through 20) or one that has been recorded by the telephone (message number 21) will be standing by for a period of a few seconds, but shall not be replayed to the audio output unless an upper case G is sent to the VT21 serial input.



The New Status Board will indicate when the "G" character is required, and can simulate this character arriving at the serial port if the green button is pressed.

The status board will interpret the w in the controller display and will begin to scroll a message - "Waiting to Go"

If the green button is pressed during the waiting time the status board will briefly display "Butt" and at that point will simulate an upper case G being sent via the serial link at 9600 baud.

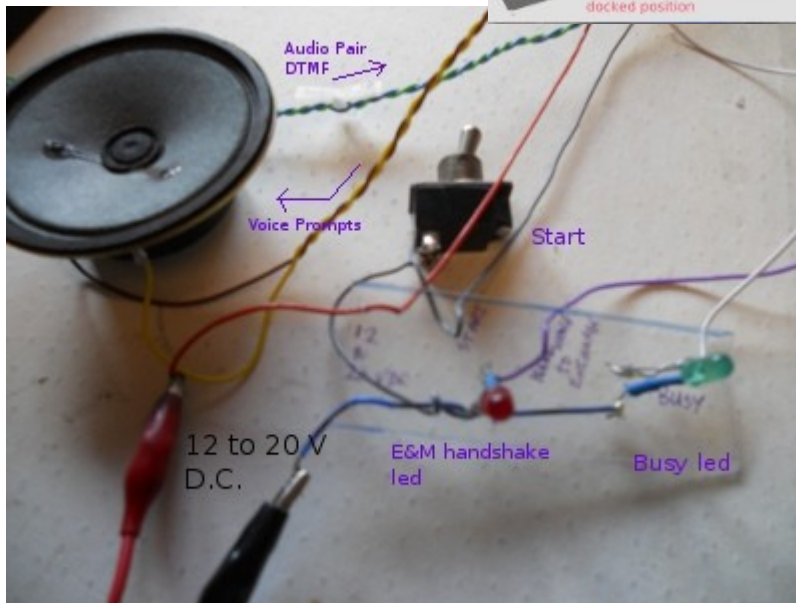
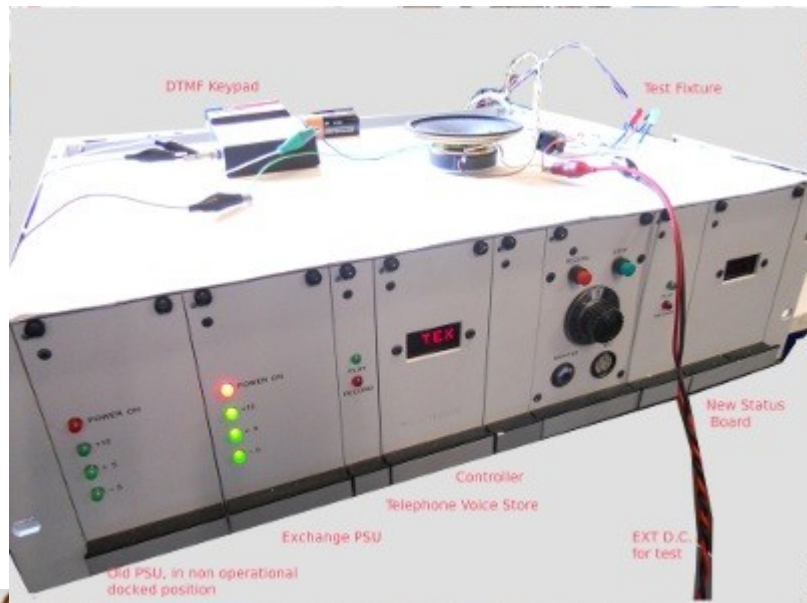
APPENDIX D2

Bench testing

A temporary test fixture using a small piece of plexiglass was constructed, in order to fully test out the interface to the telephone exchange.

To the right is a picture of how it connects.

An external DC of around 12 to 20V is required, a bench PSU at 12V was used.



The voice prompt audio is heard using a hi-z loudspeaker (50 ohm),

a toggle switch is employed to simulate the telephone "being off hook"

To test, carry out the following steps.

With DC applied you operate the toggle switch (to simulate the "phone" being off-hook)
The red LED will light after a short delay.

The VT21 controller will display

"Call" and the voice prompt will speak

"This is the voice message store, Please select message number"

At which point a DTMF source is used to enter digits.

If 01 is entered it will say "Sorry, There is No Message",

if 21 is entered it will say "Please select Zone ?" . . select a single digit e.g 3 for Zone 3.

The VT21 controller will display "M213".

It will then say "Please record your message after the tone", one can then begin recording a message on store 21.

Toggle the toggle switch to end the call (simulates going back on hook)

The status board will interpret the w in the controller display and will then display "Waiting to Go"

Press the green button, and the status board will display "Butt" at this point it will simulate an upper case G being sent via the serial link at 9600 baud.

The VT21 controller will display "P21" while it replays.